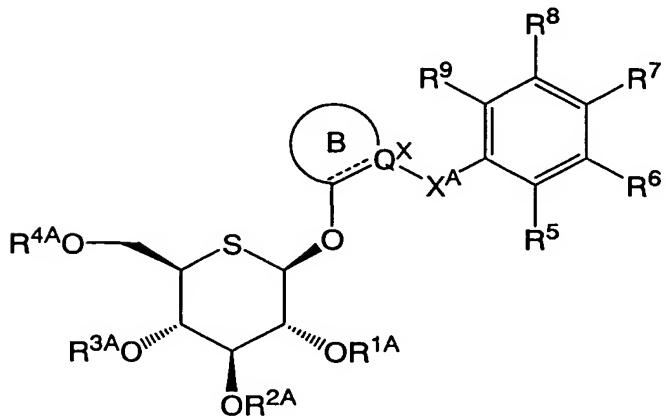


CLAIMS

1. A 5-thio- β -D-glucopyranoside compound of the following formula or a pharmaceutically acceptable salt 5 thereof or a hydrate thereof:



[wherein

B represents a heteroaryl group which may be substituted with any substituent,

10 R^{1A}, R^{2A}, R^{3A} and R^{4A}, which may be the same or different, each represent a hydrogen atom, a C₂₋₁₀ acyl group, a C₇₋₁₀ aralkyl group, a C₂₋₆ alkoxy carbonyl group, a C₁₋₆ alkoxy-C₂₋₁₀ acyl group or a C₁₋₆ alkoxy-C₂₋₆ alkoxy carbonyl group,

15 Q^x represents N or C,

X^A represents -(CH₂)_n- , -CO(CH₂)_n- , -C(OH)(CH₂)_n- , -O-(CH₂)_n- , -CONH(CH₂)_n- , -NHCO(CH₂)_n- (wherein n is an integer of 0 to 3), -COCH=CH- , -S- or -NH- , provided that when Q^x is N, X^A represents -(CH₂)_n- , -CO(CH₂)_n- , -C(OH)(CH₂)_n- , 20 -CONH(CH₂)_n- (wherein n is an integer of 0 to 3)

or -COCH=CH-, and

R⁵, R⁶, R⁷, R⁸ and R⁹, which may be the same or different, each represent:

- a hydrogen atom;
- 5 a halogen atom;
- a hydroxyl group;
- a C₁₋₆ alkyl group which may be substituted with one or more substituents selected from the group consisting of a halogen atom and a hydroxyl group;
- 10 a group represented by the formula:

- (CH₂)^{m'} -Q'

{wherein m' represents an integer of 0 to 4, and Q' represents a formyl group, an amino group, a nitro group, a cyano group, a carboxyl group, a sulfonic acid group, an 15 optionally halogen-substituted C₁₋₆ alkoxy group, a C₁₋₆ alkoxy-C₁₋₆ alkoxy group, a C₂₋₁₀ acyloxy group, a C₂₋₁₀ acyl group, a C₂₋₆ alkoxy carbonyl group, a C₁₋₆ alkylthio group, a C₁₋₆ alkylsulfinyl group, a C₁₋₆ alkylsulfonyl group, - NHC(=O)H, a C₂₋₁₀ acylamino group, a C₁₋₆ alkylsulfonylamino 20 group, a C₁₋₆ alkylamino group, an N,N-di(C₁₋₆ alkyl)amino group, a carbamoyl group, an N-(C₁₋₆ alkyl)aminocarbonyl group, or an N,N-di(C₁₋₆ alkyl)aminocarbonyl group}; or a C₃₋₇ cycloalkyl group, a C₃₋₇ cycloalkyloxy group, an 25 aryl group, a C₇₋₁₀ aralkyl group, an aryloxy group, a C₇₋₁₀ aralkyloxy group, a C₇₋₁₀ aralkylamino group, a heteroaryl group, or a 4- to 6-membered heterocycloalkyl group, provided that each of these groups may be substituted with 1 to 4 substituents selected from the group consisting of a

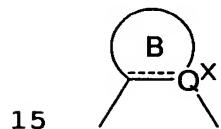
halogen atom, a hydroxyl group, a C₁₋₆ alkyl group and a C₁₋₆ alkoxy group].

2. The compound according to claim 1, wherein X^A is -(CH₂)_n- or -CO(CH₂)_n- (wherein n is an integer of 0 to 5 3), or a pharmaceutically acceptable salt thereof or a hydrate thereof.

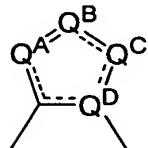
3. The compound according to claim 1, wherein X^A is -CH₂- or -CO-, or a pharmaceutically acceptable salt thereof or a hydrate thereof.

10 4. The compound according to claim 1, wherein X^A is -CH₂-, or a pharmaceutically acceptable salt thereof or a hydrate thereof.

5. The compound according to any one of claims 1 to 4, wherein the moiety represented by the formula:



is a group represented by the formula:

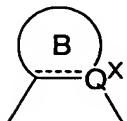


[wherein at least one of Q^A to Q^D represents a nitrogen atom, and the other each independently represent -C-Z^X, provided 20 that when Q^D is C, any one of the ring nitrogen atoms may be substituted with Z^X

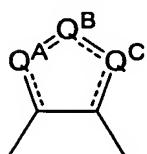
(wherein Z^X represents an optionally halogen-substituted C₁₋₆ alkyl group; an optionally halogen-substituted C₃₋, cycloalkyl group; a C₂₋₁₀ acyl group; a C₂₋₆ alkoxy carbonyl

group; a phenyl or C₇₋₁₀ aralkyl group which may be substituted with one or more substituents selected from the group consisting of a halogen atom, a C₁₋₆ alkyl group, a C₁₋₆ alkoxy group, an amino group, a nitro group, a cyano group, a carboxyl group, a C₂₋₁₀ acyl group, a C₂₋₆ alkoxy carbonyl group, a C₁₋₆ alkylthio group, a C₁₋₆ alkylsulfinyl group, a C₁₋₆ alkylsulfonyl group, a C₂₋₁₀ acylamino group, a C₁₋₆ alkylamino group, an N,N-di(C₁₋₆ alkyl)amino group, an N-(C₁₋₆ alkyl)aminocarbonyl group and 10 an N,N-di(C₁₋₆ alkyl)aminocarbonyl group; a pyridyl group; a thiienyl group; a furanyl group; or pyrimidinyl group, and Z^Y independently represents a hydrogen atom; a halogen atom; a C₁₋₆ alkyl group which may be substituted with one or more substituents selected from the group consisting of 15 a halogen atom, a hydroxyl group and a C₁₋₆ alkoxy group; an optionally halogen-substituted C₃₋₇ cycloalkyl group; a carboxyl group; or a C₂₋₆ alkoxy carbonyl group)], or a pharmaceutically acceptable salt thereof or a hydrate thereof.

20 6. The compound according to any one of claims 1 to 4, wherein the moiety represented by the formula:



is a pyrazole group represented by the formula:

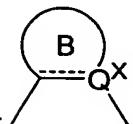


[wherein when Q^A is N and Q^B is $-N-Z^1$ or when Q^A is $-N-Z^2$ and Q^B is N, Q^C represents $-C-Z^3$, or alternatively, when Q^B is N and Q^C is $-N-Z^4$ or when Q^B is $-N-Z^5$ and Q^C is N, Q^A represents $-C-Z^6$

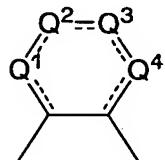
5 (wherein Z^1 , Z^2 , Z^4 and Z^5 each independently represent a hydrogen atom; an optionally halogen-substituted C_{1-6} alkyl group; an optionally halogen-substituted C_{3-7} cycloalkyl group; a C_{2-10} acyl group; a C_{2-6} alkoxy carbonyl group; a phenyl or C_{7-10} aralkyl group which may be substituted with
10 one or more substituents selected from the group consisting of a halogen atom, a C_{1-6} alkyl group, a C_{1-6} alkoxy group, an amino group, a nitro group, a cyano group, a carboxyl group, a C_{2-10} acyl group, a C_{2-6} alkoxy carbonyl group, a C_{1-6} alkylthio group, a C_{1-6} alkylsulfinyl group, a C_{1-6}
15 alkylsulfonyl group, a C_{2-10} acylamino group, a C_{1-6} alkylamino group, an N,N -di(C_{1-6} alkyl)amino group, an N -(C_{1-6} alkyl)aminocarbonyl group and an N,N -di(C_{1-6} alkyl)aminocarbonyl group; a pyridyl group; a thienyl group; a furanyl group; or a pyrimidinyl group, and Z^3 and
20 Z^6 each independently represent a hydrogen atom; a halogen atom; a C_{1-6} alkyl group which may be substituted with one or more substituents selected from the group consisting of a halogen atom, a hydroxyl group and a C_{1-6} alkoxy group; an optionally halogen-substituted C_{3-7} cycloalkyl group; a
25 carboxyl group; or a C_{2-6} alkoxy carbonyl group)], or a pharmaceutically acceptable salt thereof or a hydrate thereof.

7. The compound according to any one of claims 1 to 4,

wherein the moiety represented by the formula:



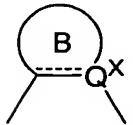
is a pyridyl group represented by the formula:



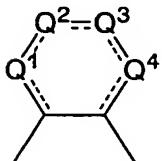
5

[wherein any one of Q¹ to Q⁴ represents N and the other each independently represent -C-Z⁷ (wherein Z⁷ represents a hydrogen atom, a halogen atom, an optionally halogen-substituted C₁₋₆ alkyl group, a C₁₋₆ alkoxy group, an amino group, a C₁₋₆ alkylamino group, an N,N-di(C₁₋₆ alkyl)amino group, a C₂₋₁₀ acylamino group, a C₂₋₁₀ acyl group or an optionally halogen-substituted C₃₋₇ cycloalkyl group)], or a pharmaceutically acceptable salt thereof or a hydrate thereof.

15 8. The compound according to any one of claims 1 to 4, wherein the moiety represented by the formula:



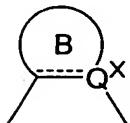
is a pyrimidyl group represented by the formula:



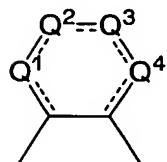
20

[wherein when Q^1 and Q^3 are each N, Q^2 and Q^4 each independently represent $-C-Z^8$, or alternatively, when Q^2 and Q^4 are each N, Q^1 and Q^3 each independently represent $-C-Z^9$ (wherein Z^8 and Z^9 each independently represent a hydrogen atom, a halogen atom, an optionally halogen-substituted C_{1-6} alkyl group, a C_{1-6} alkoxy group, an amino group, a C_{1-6} alkylamino group, an N,N -di(C_{1-6} alkyl)amino group, a C_{2-10} acylamino group, a C_{2-10} acyl group or an optionally halogen-substituted C_{3-7} cycloalkyl group)], or a pharmaceutically acceptable salt thereof or a hydrate thereof.

9. The compound according to any one of claims 1 to 4, wherein the moiety represented by the formula:



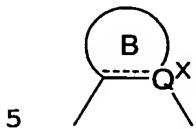
15 is a pyridazinyl group represented by the formula:



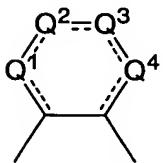
[wherein Q^1 and Q^2 , Q^2 and Q^3 , or Q^3 and Q^4 each represent N, and the other each represent $-C-Z^{10}$ (wherein Z^{10} independently represents a hydrogen atom, a halogen atom, an optionally halogen-substituted C_{1-6} alkyl group, a C_{1-6} alkoxy group, an amino group, a C_{1-6} alkylamino group, an N,N -di(C_{1-6} alkyl)amino group, a C_{2-10} acylamino group, a C_{2-10} acyl group or an optionally halogen-substituted C_{3-7}

cycloalkyl group)], or a pharmaceutically acceptable salt thereof or a hydrate thereof.

10. The compound according to any one of claims 1 to 4, wherein the moiety represented by the formula:

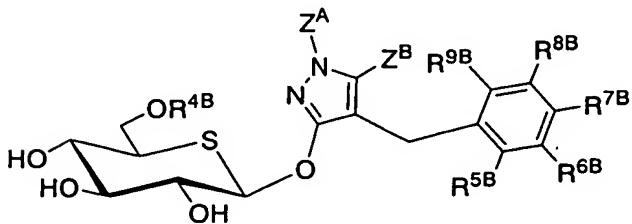


is a pyrazinyl group represented by the formula:



[wherein Q¹ and Q⁴ each represent N and the other each 10 represent -C-Z¹¹ (wherein Z¹¹ independently represents a hydrogen atom, a halogen atom, an optionally halogen-substituted C₁₋₆ alkyl group, an amino group, a C₁₋₆ alkoxy group, a C₁₋₆ alkylamino group, an N,N-di(C₁₋₆ alkyl)amino group, a C₂₋₁₀ acylamino group, a C₂₋₁₀ acyl group or an 15 optionally halogen-substituted C₃₋₇ cycloalkyl group)], or a pharmaceutically acceptable salt thereof or a hydrate thereof.

11. A 5-thio- β -D-glucopyranoside compound of the following formula or a pharmaceutically acceptable salt 20 thereof:



(wherein Z^A represents a hydrogen atom, a C_{1-6} alkyl group, a halogen-substituted C_{1-6} alkyl group, a C_{3-6} cycloalkyl group, a benzyl group, a C_{2-10} acyl group or a C_{2-6} alkoxycarbonyl group, Z^B represents a C_{1-6} alkyl group or a 5 halogen-substituted C_{1-6} alkyl group, R^{5B} to R^{9B} , which may be the same or different, each represent a hydrogen atom, a halogen atom, a C_{1-6} alkyl group, a halogen-substituted C_{1-6} alkyl group, a C_{3-6} cycloalkyl group, a C_{1-6} alkoxy group, a halogen-substituted C_{1-6} alkoxy group or a C_{1-6} alkylthio 10 group, and R^{4B} represents a hydrogen atom, a C_{2-10} acyl group or a C_{2-6} alkoxycarbonyl group).

12. A pharmaceutical preparation, which comprises the 5-thio- β -D-glucopyranoside compound according to any one of claims 1 to 11 or a pharmaceutically acceptable salt 15 thereof or a hydrate thereof as an active ingredient.

13. The pharmaceutical preparation according to claim 12, which is an inhibitor of sodium-dependent glucose transporter 2 activity.

14. The pharmaceutical preparation according to claim 13, 20 which is a prophylactic or therapeutic agent for diabetes, diabetes-related diseases or diabetic complications.

15. A pharmaceutical preparation, which comprises the 5-thio- β -D-glucopyranoside compound according to any one of claims 1 to 11 or a pharmaceutically acceptable salt 25 thereof or a hydrate thereof, in combination with at least one drug selected from the group consisting of an insulin sensitizer selected from the group consisting of a PPAR γ agonist; a PPAR α/γ agonist; a PPAR δ agonist; and a PPAR $\alpha/\gamma/\delta$

agonist, a glycosidase inhibitor, a biguanide, an insulin secretagogue, an insulin formulation and a dipeptidyl peptidase IV inhibitor.

16. A pharmaceutical preparation, which comprises the

5 5-thio- β -D-glucopyranoside compound according to any one of claims 1 to 11 or a pharmaceutically acceptable salt thereof or a hydrate thereof, in combination with at least one drug selected from the group consisting of a hydroxymethylglutaryl coenzyme A reductase inhibitor, a

10 fibrate, a squalene synthase inhibitor, an acyl-coenzyme A:cholesterol acyltransferase inhibitor, a low-density lipoprotein receptor promoter, a microsomal triglyceride transfer protein inhibitor and an anorectic.